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मानक

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IS 10436 (1983): Electric Frying Pans and Deep Fat Fryers  
[ETD 32: Electrical Appliances]



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“Knowledge is such a treasure which cannot be stolen”



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IS : 10436 - 1983

*Indian Standard*  
SPECIFICATION FOR  
ELECTRIC FRYING PANS AND  
DEEP FAT FRYERS

UDC 643.353.14 : 621.365



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**INDIAN STANDARDS INSTITUTION**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

**AMENDMENT NO. 1    MAY 1989**  
**TO**  
**IS : 10436 - 1983 SPECIFICATION FOR ELECTRIC**  
**FRYING PANS AND DEEP FAT FRYERS**

( *Page 10, clause 18* ) — Substitute the following for the existing clause:

**'18. ENDURANCE**

This clause of IS : 302-1979 is applicable except as follows:

**18.1 Replacement** — The thermostat, if provided, is set at the maximum setting. The frying pan and deep fat fryer is operated at 1.15 times the rated input. Under these conditions, it is operated for 96 operating hours.

**18.2 to 18.4** — Not applicable.

**18.5 Replacement** — After this test, the frying pan and deep fat fryer shall withstand the electric strength test of 16.4 of IS : 302-1979.'

( ETDC 43 )

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**AMENDMENT NO. 2   JUNE 1992**  
**TO**  
**IS 10436 : 1983 SPECIFICATION FOR ELECTRIC**  
**FRYING PANS AND DEEP FAT FRYERS**

Substitute 'IS 302-1(1979) Safety of household and similar electrical appliances : Part 1 General requirements ( *fifth revision* )' for 'IS 302 : 1979 General and safety requirements for household and similar electrical appliances ( *fifth revision* )' wherever it appears in the standard.

( ETD 32 )

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Reprography Unit, BIS, New Delhi, India

# Indian Standard

## SPECIFICATION FOR ELECTRIC FRYING PANS AND DEEP FAT FRYERS

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( Continued on page 2 )

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## IS : 10436 - 1983

( Continued from page 1 )

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*Indian Standard*  
**SPECIFICATION FOR  
ELECTRIC FRYING PANS AND  
DEEP FAT FRYERS**

**0. F O R E W O R D**

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 27 January 1983, after the draft finalized by the Electrical Appliances Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** This standard is to be read in conjunction with IS : 302-1979\*. For the sake of convenience, the clauses of this standard correspond to those of IS : 302-1979\*. Clauses which are applicable ( which means that relevant provisions of that clause apply ) or not applicable and necessary changes wherever required are indicated accordingly. Clauses/sub-clauses tables which are additional to those of IS : 302-1979\* are numbered starting from 101. Should, however, any deviation exist between IS : 302-1979\* and this standard, the provisions of the latter shall apply. In line with IS : 302-1979\* and for the sake of brevity, frying pans and deep fat fryers are referred at some of the places in the text as appliances.

**0.3** Though this standard includes endurance test, yet it has not been possible to include performance tests to simulate the conditions of actual use. Such tests are under consideration and may be added at a later date.

**0.4** While preparing this standard, assistance has been derived from IEC Publication 335-2-13 Safety of household and similar electrical appliances, Part 2 : Particular requirements for frying pans, deep fat fryers and similar appliances, issued by the International Electrotechnical Commission.

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\*General and safety requirements for household and similar electrical appliances ( fifth revision ).

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## **1. SCOPE**

This clause of IS : 302-1979† is applicable except as follows:

### **1.1 Replacement:**

This standard covers the requirements for frying pans including deep fat fryers.

NOTE — While this standard cannot be applied to commercial catering equipment without some modifications it may form a guide for tests and requirement for such equipment.

## **2. TERMINOLOGY**

This clause of IS : 302-1979† is applicable except as follows:

### **2.29 Replacement:**

*Conditions of Adequate Heat Discharge* — The conditions that apply when appliances are operated under the following conditions:

Frying pans are filled with initially cold frying oil to a height of 1 cm above the highest point of the heating surface and operated so that the oil is brought to a temperature of  $250 \pm 15^{\circ}\text{C}$  measured at the centre of the heating surface and then maintained within  $\pm 15^{\circ}\text{C}$  of  $250^{\circ}\text{C}$  either by means of the thermostat or, if there is no thermostat, by switching the supply on and off. If with the thermostat set to its maximum, this temperature is not reached, the appliance is operated at its maximum setting. No lid shall be placed on the frying pans.

Deep fat fryers are filled with initially cold frying oil to the minimum oil level as marked and then operated with the thermostat, if any, set to the maximum setting. The lid is open or removed unless deep fat fryer is so designed that it can only be operated with the lid in closed position.

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\*Rules for rounding off numerical values ( revised ).

†General and safety requirements for household and similar electrical appliances ( fifth revision ).

**Additional Sub-clauses:**

**2.101 Electric Frying Pan** — An electrically heated cooking vessel in which frying can be done using small quantities of fat. The heating element is generally so arranged that there is uniform distribution of heat for carrying out frying operation.

**2.102 Electric Deep Fat Fryer** — An electrically heated cooking vessel in which frying inside sufficiently large quantity of fat can be carried out. Deep fat fryers are generally so constructed that the heating element projects into the oil container and the vessel is marked with the minimum oil level.

**3. GENERAL REQUIREMENTS**

This clause of IS : 302-1979\* is applicable except that the provisions of second para of 3.1 are not applicable.

**4. GENERAL NOTES ON TESTS**

This clause of IS : 302-1979\* is applicable except as follows:

**4.2 Addition:**

If frying pans or deep fat fryers are intended to be immersed in water fully or partially for cleaning, three additional samples are required.

**4.7 Addition:**

Deep fat fryers which can also be used as frying pans, that is, those in which the heating element does not project into the oil container and which are not provided with a minimum level mark, are tested as frying pans or deep fat fryers, whichever is most unfavourable for the particular test.

**4.8, 4.10, 4.13 and 4.14** Not applicable.

**5. RATING**

This clause of IS : 302-1979\* is applicable.

**6. CLASSIFICATION**

This clause of IS : 302-1979\* is applicable.

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\*General and safety requirements for household and similar electrical appliances ( *fifth revision* ).

## **7. MARKING**

This clause of IS : 302-1979\* is applicable except as follows:

### **7.1 Addition:**

Deep fat fryers shall be marked with the minimum oil level unless they can be used as frying pans.

### **Additional Sub-clauses:**

**7.101** For portable appliances not intended to be immersed, the instruction leaflet shall state that the appliance must not be immersed.

NOTE — Portable frying pans are considered as appliances intended to be fully or partially immersed in water while cleaning.

**7.102** Appliances intended to be partially immersed shall be clearly marked with an identified water line and bear the warning 'Do not immerse beyond water line'.

The water line indicating the maximum depth of immersion shall be spaced at least 5 cm from any seam or seals that are not capable of withstanding the moisture resistance test as outlined in **15.101**.

**7.103** For appliances other than those of watertight construction which are intended to be immersed in water while cleaning, the instruction sheet shall state that the connector must be removed before the appliance is cleaned and that the appliance inlet must be dried before the appliance is used again.

**7.104** For appliances intended to be used with a connector incorporating a thermostat, the instruction sheet shall state such appliances must be used only with the appropriate connector.

**7.105** Electric frying pans and deep fat fryers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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\*General and safety requirements for household and similar electrical appliances ( fifth revision ).

## **8. PROTECTION AGAINST ELECTRIC SHOCK**

This clause of IS : 302-1979\* is applicable except as follows:

**8.2 and 8.3** Not applicable.

## **9. STARTING OF MOTOR OPERATED APPLIANCES**

This clause of IS : 302-1979\* is not applicable.

## **10. INPUT AND CURRENT**

This clause of IS : 302-1979\* is applicable except as follows:

**10.2** Not applicable.

## **11. TEMPERATURE RISE**

This clause of IS : 302-1979\* is applicable except as follows:

### **11.7 Replacement:**

Frying pans and deep fat fryers are operated until steady state conditions are established. In case of deep fat fryers, the oil temperature is to be measured 1 cm from the bottom or, if the heating element(s) are in the container, 1 cm above the highest point of the heating element(s) and at least 1 cm from any wall of the container.

Frying pans and deep fat fryers are tested away from the walls of the test corner.

### **11.8 Addition:**

The temperature-rise of the oil in deep fat fryers shall not exceed 220°C.

## **12. OPERATION UNDER OVERLOAD CONDITIONS OF APPLIANCES WITH HEATING ELEMENT**

This clause of IS : 302-1979\* is applicable except as follows:

### **12.2 Addition:**

Care should be taken to ensure that the oil is cold before starting each operating period. Forced cooling may be used during the test.

**12.3** Not applicable.

## **13. ELECTRICAL INSULATION AND LEAKAGE CURRENT AT OPERATING TEMPERATURE**

This clause of IS : 302-1979\* is applicable except as follows:

\*General and safety requirements for household and similar electrical appliances (fifth revision).

**13.2 Addition:**

In case the appliance incorporates thermostat, the leakage current is measured immediately before the thermostat operates.

**14. RADIO AND TELEVISION INTERFERENCE SUPPRESSION**

This clause of IS : 302-1979\* is applicable.

**15. MOISTURE RESISTANCE**

This clause of IS : 302-1979\* is applicable except as follows:

**15.1 Replacement:**

Frying pans and deep fat fryers not intended to be immersed in water are subjected to tests of **15.3** and **15.4**.

If they are intended to be immersed either partially or fully in water they are subjected to the tests of **15.4** and **15.101**.

In case the appliance is not provided with an indication for partial immersion or for which there is no warning against immersion in the instruction leaflet is regarded as being totally immersible in water.

NOTE — If it is necessary to dry the appliance-inlet ( in case provided ) before subjecting to the test of **16.4**, the appliance is not taken to be of watertight construction and shall not be marked with the corresponding symbol.

**Additional Sub-clause:**

**15.101** Appliances intended to be partially or completely immersed in water for cleaning shall have adequate protection against the effects of immersion. Compliance is checked by the following tests, which are made on three additional samples.

The samples are operated empty, with any thermostat adjusted to the highest setting and at a supply voltage such that the input is 1.15 times rated input, until the thermostat operates for the first time or, for appliances without a thermostat, until the centre of the heated surface attains the temperature as specified for conditions of adequate heat discharge.

The connectors are then withdrawn or the supply otherwise switched off and the samples immediately immersed completely in water having a temperature between 10°C and 25°C, unless they are marked with a line indicating the maximum depth of immersion, in which case they are immersed to the depth indicated. After 1 h of immersion, the samples

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\*General and safety requirements for household and similar electrical appliances ( *fifth revision* ).

are removed from the water and dried, care being taken to ensure that all moisture is removed from the insulation in the vicinity of the pins of appliance inlets. The leakage current is then measured as described in **16.2**. For each of the three samples, the leakage current shall not exceed the value specified in **16.2**.

The test described above and the measurement of the leakage current are made five times, after which the samples shall withstand an electric strength test as specified in **16.4**, the test voltage being, however, reduced to 1 000 V.

The sample showing the largest leakage current after the fifth immersion is dismantled, and inspection shall show that water has not entered the appliance to any appreciable extent and that there is no trace of water on insulation for which creepage distances are specified in **29.1**.

The remaining two empty samples are then operated with any thermostat adjusted to the highest setting or, for appliances without a thermostat, so that the centre of the heated surface attains a temperature of 250°C, for 10 days ( 240 h ). During this period, the samples are allowed to cool to approximately room temperature five times at regular intervals. After this period, the connectors of the two samples are withdrawn or the supply otherwise switched off and the samples immediately immersed once more in water for 1 h as described before. They are then dried and the leakage current is measured again as described in **16.2**. For each of the two samples, the leakage current shall not exceed the value specified in **16.2**. These samples shall then withstand on electrical strength test as specified before, and visual inspection shall show that water has not entered the appliance to any appreciable extent and that there is no trace of water on insulation for which creepage distances are specified in **29.1**.

NOTE — When inspecting the appliances for the presence of water, special attention is paid to parts of the appliance in which electrical components are situated.

## **16. INSULATION RESISTANCE AND ELECTRIC STRENGTH ( AFTER HUMIDITY TREATMENT )**

This clause of IS : 302-1979\* is applicable except as follows:

**16.3** Not applicable.

## **17. OVERLOAD PROTECTION**

This clause of IS : 302-1979\* is applicable.

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\*General and safety requirements for household and similar electrical appliances  
( fifth revision ).

## **18. ENDURANCE**

This clause of IS : 302-1979\* is applicable except as follows:

### **18.1 Replacement:**

In case of frying pans and deep fat fryers not provided with thermostats, the endurance test on heating element is carried out in accordance with the requirements of relevant Indian Standard on the type of heating element used.

Frying pans and deep fat fryers provided with thermostats are operated at 1.1 times rated voltage/upper limit of the rated voltage range for 10 000 cycles of operation of thermostat under conditions of adequate heat discharge.

NOTE — This test may be combined with the test for thermostat as given in Appendix G of IS : 302-1979\*.

**18.2 to 18.5 inclusive** Not applicable.

## **19. ABNORMAL OPERATION**

This clause of IS : 302-1979\* is applicable except as follows:

### **19.2 Note under the existing clause: Replacement:**

NOTE — Frying pans are tested under the conditions specified in 11 but without oil in the container and with the lids open or closed, whichever imposes more severe condition.

Deep fat fryers are operated at the level of oil which will cause maximum oil temperature, with the thermostats, if any; set at the position which gives maximum heat and with the appliance initially at room temperature.

### **19.3 Replacement:**

For frying pans, the test of 19.2 is repeated, but with the frying pan operated in accordance with conditions of adequate heat discharge until steady conditions are established, except that the thermostat, if any, is adjusted to its highest setting and the supply voltage is such that the input is 1.15 times rated input.

For deep fat fryers, the test of 19.2 is repeated, but with a supply voltage such that the input is 1.24 times rated input.

**19.6 to 19.10 inclusive** Not applicable.

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\*General and safety requirements for household and similar electrical appliances (fifth revision).



**19.11 Addition:**

During the tests, the temperature rise at the centre of the heated surface of frying pans and the temperature rise of the oil in deep fat fryers shall not exceed 270°C with the exception that, during the tests of **19.2** and **19.3**, the temperature rise of the oil in deep fat fryers, measured at a distance of not less than 5 mm from any surface inside the container, shall not exceed 240°C.

**20. STABILITY AND MECHANICAL HAZARDS**

This clause of IS : 302-1979\* is applicable except as follows:

**20.2** Not applicable.

**21. MECHANICAL STRENGTH**

This clause of IS : 302-1979\* is applicable.

**22. CONSTRUCTION**

This clause of IS : 302-1979\* is applicable except as follows:

**22.24 Replacement:**

Heating elements shall be so designed or supported that they maintain their original position throughout normal use; in particular, it shall not be possible for a heating element to become displaced when appliance is lifted by its carrying handle, if any, or for a broken heating element to fall out of the appliance.

Compliance is checked by inspection and by manual test.

**22.26** Not applicable.

**Additional Sub-clauses:**

**22.101** Deep fat fryers shall be so constructed that spillage of the hot fat on parts operating at temperature higher than 300°C is prevented.

**22.102** Frying pans having an exterior surface of glass, ceramic or comparably brittle material in or on which the heating element is mounted, or which is an essential part of the enclosure of live metal parts, shall be capable of withstanding the stresses liable to be encountered in actual service, compliance of which is checked as under.

The glass or ceramic surface shall withstand, without cracking or breaking, the impact of a hardened steel ball of 900 g mass dropped from a height of a 8 cm. The ball is dropped ten times on to the surface in both cold and fully heated conditions.

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\*General and safety requirements for household and similar electrical appliances (fifth revision).

## **IS : 10436 - 1983**

The glass or ceramic surface shall withstand, without cracking or breaking the application of a cloth fully saturated with water at room temperature, with the appliance in the fully heated condition. The appliance shall then be subjected to the test given in 16.2.

### **23. INTERNAL WIRING**

This clause of IS : 302-1979\* is applicable.

### **24. COMPONENTS**

This clause of IS : 302-1979\* is applicable.

### **25. SUPPLY CONNECTIONS AND EXTERNAL FLEXIBLE CABLES AND CORDS**

This clause of IS : 302-1979\* is applicable except as follows:

#### **25.4 Addition:**

Type Z attachment is not allowed unless the appliance is connected to the supply by means of an appliance coupler incorporating a thermostat.

#### **25.6 Addition:**

This power supply cord of deep fat fryers shall be oil resistant.

### **26. TERMINALS FOR EXTERNAL CONDUCTORS**

This clause of IS : 302-1979\* is applicable.

### **27. PROVISION FOR EARTHING**

This clause of IS : 302-1979\* is applicable.

### **28. SCREWS AND CONNECTIONS**

This clause of IS : 302-1979\* is applicable.

### **29. CREEPAGE DISTANCES AND CLEARANCES**

This clause of IS : 302-1979\* is applicable.

### **30. RESISTANCE TO HEAT, FIRE AND TRACKING**

This clause of IS : 302-1979\* is applicable.

### **31. RESISTANCE TO RUSTING**

This clause of IS : 302-1979\* is not applicable.

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\*General and safety requirements for household and similar electrical appliances (fifth revision).

**32. RADIATION HAZARDS**

This clause of IS : 302-1979\* is applicable.

**33. FINISH**

This clause of IS : 302-1979\* is applicable.

**Additional clauses:****101. TESTS**

**101.0 Categories of Tests** — The tests are classified as type, routine and acceptance tests.

**101.1 Type Tests** — The tests specified in Table 101 shall constitute type tests and shall be carried out on two samples of the same type and rating selected preferably at random from a regular production lot.

**101.1.1** Both the samples shall successfully pass all the type tests for providing conformity with requirements of the standard. If any of the samples should fail in any of the type test(s), the testing authority at its discretion may call for fresh samples not exceeding twice the original number and subject them again to all the tests or to the test(s) in which failure(s) occurred. No failure shall be permitted in the repeat tests.

**101.2 Acceptance Tests** — The following shall constitute the acceptance tests:

<i>TEST</i>	<i>CLAUSE REFERENCE</i>
a) Protection against electric shock	8
b) Input	10
c) Temperature rise	11
d) Leakage current and high voltage at operating temperature	13
e) Moisture resistance	15
f) Insulation and electric strength ( after humidity treatment )	16
g) Provision for earthing	27

**101.2.1** A recommended sampling plan is given in Appendix B of IS : 302-1979\*.

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\*General and safety requirements for household and similar electrical appliances  
( fifth revision ).

TABLE 101 SCHEDULE OF TYPE TESTS

( Clause 101.1 )

Sl. No.	TEST	CLAUSe REFERENCE
(1)	(2)	(3)
1.	Protection against electric shock	8
2.	Input	10
3.	Temperature-rise	11
4.	Operation under overload conditions	12
5.	Leakage current and high voltage at operating temperature	13
6.	Moisture resistance	15
7.	Insulation resistance and electric strength ( after Humidity treatment )	16
8.	Overload protection	17
9.	Endurance	18
10.	Abnormal operation	19
11.	Stability and mechanical hazards	20
12.	Mechanical strength	21
13.	Cord grip and cord guard	25
14.	Screws and connections	28
15.	Creepage distance and clearances	29
16.	Resistance to heat, fire and tracking	30
17.	Resistance to rusting	31
18.	Finish	33

NOTE — In case, test of 15.101 is applicable, three additional samples are required for carrying out this test ( see 4.2 ).

### 101.3 Routine Tests — The following shall constitute the routine tests:

Test	Clause Reference
a) Protection against electric shock	8
b) High voltage	13.4 of IS : 302-1979*
c) Earthing connection	27

NOTE 1 — Before commencement of the tests, the appliance shall be visually examined and inspected for obvious visual defects in respect of components, parts and their assembly, constructional requirements, marking and provision of suitable terminals for supply connections and earthing.

NOTE 2 — The supply connections shall be of size appropriate to the rating ( see 25 ).

\*General and safety requirements for household and similar electrical appliances ( fifth revision ).

# INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

## Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

## INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 61 31

Telegrams : Manaksanstha

### Regional Offices:

		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	89 65 28
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	27 50 90
Southern : C. I. T. Campus	MADRAS 600113	41 24 42
Northern : B69, Phase VII	S.A.S. NAGAR (MOHALI) 160051	8 78 26

### Branch Offices:

'Pushpak', Nurmoahmed Shaikh Marg, Kanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	22 48 05
Gangotri Complex, Bhadbhada Road, T.T. Nagar	BHOPAL 462003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
5-8-56G L. N. Gupta Marg	HYDERABAD 500001	22 10 83
R 14 Yudhyster Marg, C Scheme	JAIPIR 302005	6 98 32
117/418 B Sarvodaya Nagar	KANPUR 208005	4 72 92
Pariputra Industrial Estate	PATNA 800015	6 28 08
Hantex Bldg ( 2nd Floor ), Rly Station Road	TRIVANDRUM 695001	32 27

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